

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

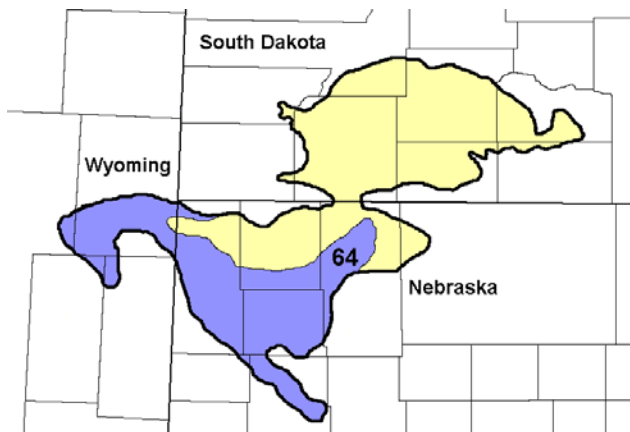
Site Name: Clayey 14-17" P.Z.

Site ID: R064XY014NE

Major Land Resource Area:
64 – Mixed Sandy and Silty Tableland

Physiographic Features

This site occurs on nearly level to steep uplands and colluvial fans.



Landform: fan, plain, hill, stream terrace

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2900	4000
Slope (percent):	0	30
Water Table Depth (inches):	None	None
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Low	Very high

Climatic Features

MLRA 64 is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature may also abound. The climate is the result of this MLRA's location near the geographic center of North America. There are few natural barriers on the northern Great Plains and the winds move freely across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 14 to 17 inches per year. The normal average annual temperature is about 46° F. January is the coldest month with average temperatures ranging from about 22° F (Keeline 3 W, WY) to about 25° F (Hemingford, NE). July is the warmest month with temperatures averaging from about 70° F (Keeline 3 W, WY) to about 72° F (Hemingford, NE). The range of normal average monthly temperatures between the coldest and warmest months is about 50° F. This large annual range attests to the continental nature of this area's climate. Hourly winds are estimated to average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of native cool season plants begins about March 15 and continues to about June 30. Native warm season plants begin growth about May 15 and continue to about August 1. Green up of cool season plants may occur in September and October of most years.

	<u>Minimum</u>	<u>Maximum</u>
Frost-free period (days):	115	139
Freeze-free period (days):	137	163
Mean Annual Precipitation (inches):	14	17

Average Monthly Precipitation (inches) and Temperature (°F):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.46	0.52	10.0	35.8
February	0.48	0.55	15.1	40.7
March	0.90	1.00	21.0	47.5
April	1.83	1.95	28.9	56.8
May	2.22	3.26	38.3	67.4
June	2.05	2.89	47.3	78.2
July	1.63	2.38	53.9	86.5
August	1.09	1.59	52.3	84.6
September	1.09	1.33	42.4	74.6
October	0.80	1.02	32.6	62.4
November	0.56	0.64	20.4	46.8
December	0.42	0.49	13.4	38.4

Climate Stations		Period	
Station ID	Location or Name	From	To
NE3755	Hemingford, NE	1964	1999
WY5085	Keeline 3 W, WY	1953	1986

For local climate stations that may be more representative, refer to <http://www.wcc.nrcs.usda.gov>.

Influencing Water Features

No significant water features influence this site.

Representative Soil Features

The common features of soils in this site are the silty clay loam to clay textured subsoils and slopes of 0 to 30 percent. The soils in this site are well drained and formed in alluvium, colluvium, and residuum derived primarily from shale. The silty clay loam to loam surface layer is 5 to 6 inches thick. The soils have a moderately slow to slow infiltration rate. When dry these soils crack. When wet surface compaction can occur with heavy traffic. This site typically should show slight to no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases on slopes greater than about 5 percent. Loss of 50 percent or more of the surface layer of the soils on this site can result in a shift in species composition and/or production.

More information can be found in the various soil survey reports. Contact the local USDA Service Center for soil survey reports that include more detail specific to your location.

Site Type: Rangeland
MLRA: 64 – Mixed Sandy and Silty Tableland

Clayey 14-17" P.Z.
R064XY014NE

Parent Material Kind: residuum, colluvium, alluvium
Parent Material Origin: shale, clayey
Surface Texture: loam, silty clay loam, clay loam
Surface Texture Modifier: none
Subsurface Texture Group: clayey
Surface Fragments $\leq 3''$ (% Cover): 0
Surface Fragments $> 3''$ (%Cover): 0
Subsurface Fragments $\leq 3''$ (% Volume): 0-13
Subsurface Fragments $> 3''$ (% Volume): 0-6

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	well	well
Permeability Class:	slow	moderately slow
Depth (inches):	20	>72
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	10
Soil Reaction (1:1 Water)*:	6.6	9.0
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	4	6
Calcium Carbonate Equivalent (percent)*:	0	30

* - These attributes represent from 0-40 inches or to the first restrictive layer.

Plant Communities

Ecological Dynamics of the Site:

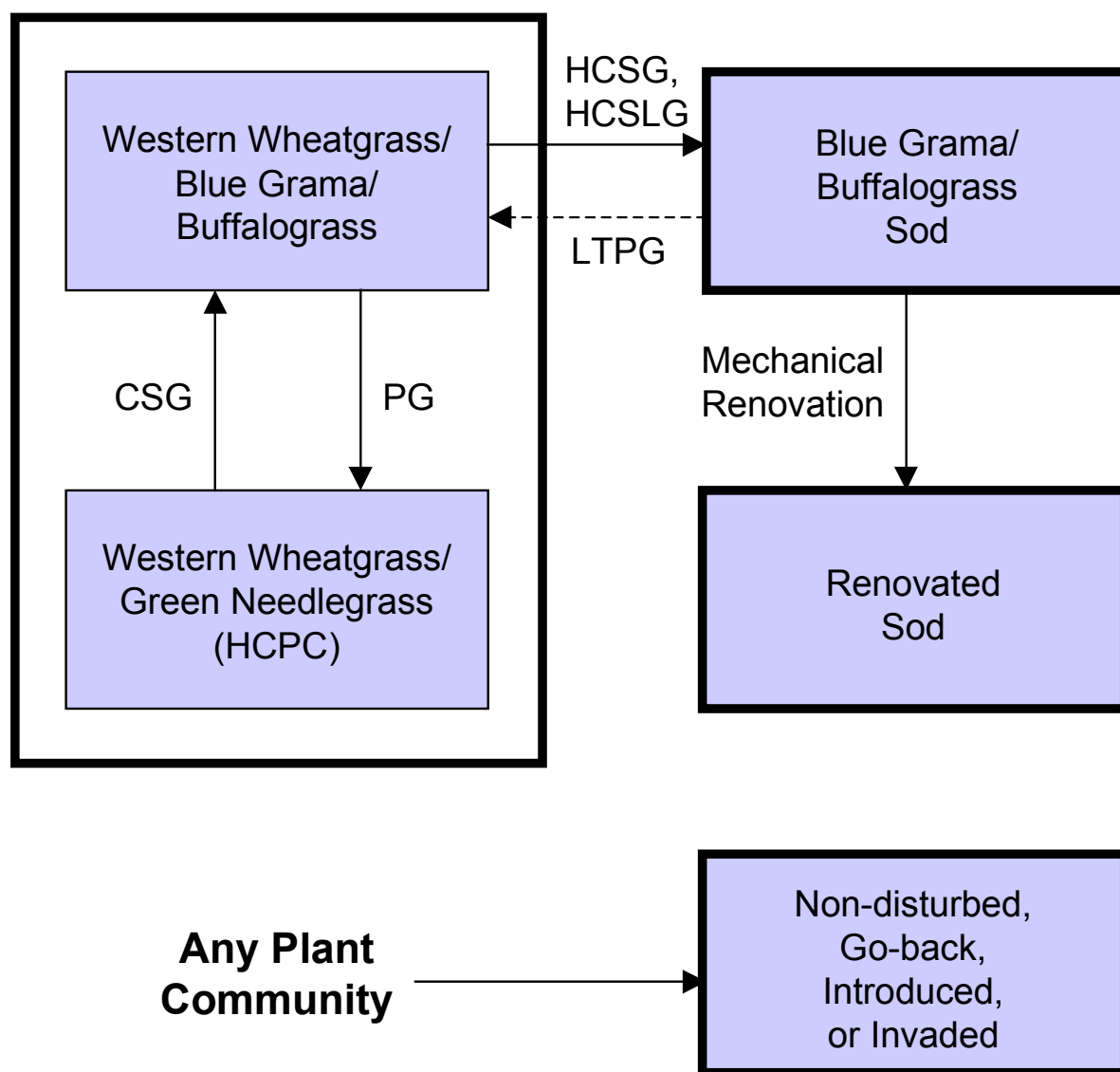
The site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to management actions and/or climatic conditions.

Encroachment may occur from associated sites. Black greasewood, ponderosa pine, Rocky Mountain juniper and bur oak have the potential to shift site characteristics. These shifts can alter the site dynamics and potential. These species may occur in small amounts on several plant communities.

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community (HCPC). The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

The following is a diagram that illustrates the common plant communities that can occur on the site and the transitions between communities. The ecological processes will be discussed in more detail in the plant community narratives following the diagram.

Plant Communities and Transitional Pathways



CSG - Continuous seasonal grazing; **HCPC** - Historical Climax Plant Community; **HCSG** - Heavy, continuous seasonal grazing; **HCSLG** - Heavy, continuous season-long grazing; **LTPG** - Long-term prescribed grazing; **PG** - Prescribed grazing.

Plant Community Composition and Group Annual Production

			Western Wheatgrass/ Green Needlegrass (HCPC)		
COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES				1350 - 1530	75 - 85
RHIZOMATOUS WHEATGRASS			1	540 - 900	30 - 50
western wheatgrass	Pascopyrum smithii	PASM	1	540 - 900	30 - 50
thickspike wheatgrass	Elymus lanceolatus ssp. lanceolatus	ELLAL	1	90 - 360	5 - 20
COOL-SEASON MID GRASS			2	450 - 720	25 - 40
green needlegrass	Nassella viridula	NAVI4	2	450 - 720	25 - 40
WARM-SEASON GRASSES			3	36 - 180	2 - 10
blue grama	Bouteloua gracilis	BOGR2	3	36 - 180	2 - 10
buffalograss	Buchloe dactyloides	BUDA	3	0 - 90	0 - 5
sideoats grama	Bouteloua curtipendula	BOCU	3	90 - 270	5 - 15
NATIVE GRASSES & GRASS-LIKES			4	90 - 270	5 - 15
big bluestem	Andropogon gerardii	ANGE	4	0 - 90	0 - 5
needleandthread	Hesperostipa comata ssp. comata	HECOC8	4	0 - 90	0 - 5
prairie junegrass	Koeleria macrantha	KOMA	4	0 - 90	0 - 5
Sandberg bluegrass	Poa secunda	POSE	4	0 - 36	0 - 2
sedge	Carex spp.	CAREX	4	0 - 90	0 - 5
threeawn	Aristida spp.	ARIST	4	0 - 36	0 - 2
dropseed	Sporobolus spp.	SPORO	4	0 - 18	0 - 1
other perennial grasses		2GP	4	0 - 54	0 - 3
FORBS			6	90 - 270	5 - 15
American vetch	Vicia americana	VIAM	6	0 - 18	0 - 1
aster	Aster spp.	ASTER	6	0 - 18	0 - 1
biscuitroot	Lomatium spp.	LOMAT	6	0 - 18	0 - 1
cudweed sagewort	Artemisia ludoviciana	ARLU	6	0 - 18	0 - 1
cutleaf ironplant	Machaeranthera pinnatifida	MAPI	6	0 - 18	0 - 1
deathcamas	Zigadenus spp.	ZIGAD	6	0 - 18	0 - 1
deervetch	Lotus unifoliolatus var. unifoliolatus	LOUNU	6	0 - 18	0 - 1
dotted gayfeather	Liatris punctata	LIPU	6	0 - 36	0 - 2
false boneset	Brickellia eupatorioides	BREU	6	0 - 18	0 - 1
goldenrod	Solidago spp.	SOLID	6	0 - 18	0 - 1
penstemon	Penstemon spp.	PENST	6	0 - 36	0 - 2
prairie coneflower	Ratibida columnifera	RACO3	6	0 - 36	0 - 2
pussytoes	Antennaria spp.	ANTEN	6	0 - 18	0 - 1
scarlet gaura	Gaura coccinea	GACO5	6	0 - 18	0 - 1
scarlet globemallow	Sphaeralcea coccinea	SPCO	6	0 - 36	0 - 2
scurfpea	Psoralegium spp.	PSORA2	6	0 - 36	0 - 2
thistle	Cirsium spp.	CIRSI	6	0 - 18	0 - 1
western ragweed	Ambrosia psilostachya	AMPS	6	0 - 18	0 - 1
western wallflower	Erysimum capitatum var. capitatum	ERCAC	6	0 - 18	0 - 1
western yarrow	Achillea millefolium	ACMI2	6	0 - 18	0 - 1
wild parsley	Musineon divaricatum	MUDI	6	0 - 18	0 - 1
woolly Indianwheat	Plantago patagonica	PLPA2	6	0 - 18	0 - 1
other perennial forbs		2FP	6	0 - 36	0 - 2
SHRUBS			7	90 - 180	5 - 10
black greasewood	Sarcobatus vermiculatus	SAVE4	7	0 - 18	0 - 1
broom snakeweed	Gutierrezia sarothrae	GUSA2	7	0 - 18	0 - 1
cactus	Opuntia spp.	OPUNT	7	0 - 18	0 - 1
fourwing saltbush	Atriplex canescens	ATCA2	7	0 - 36	0 - 2
fringed sagewort	Artemisia frigida	ARFR4	7	0 - 18	0 - 1
rose	Rosa spp.	ROSA5	7	0 - 36	0 - 2
winterfat	Krascheninnikovia lanata	KRLA2	7	0 - 36	0 - 2
other shrubs		2SHRUB	7	0 - 36	0 - 2

Annual Production lbs./acre		LOW	RV	HIGH
GRASSES & GRASS-LIKES		730 -	1485	-2015
FORBS		85 -	180	-300
SHRUBS		85 -	135	-185
TOTAL		900 -	1800	-2500

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community Composition and Group Annual Production

		Western Wheatgrass/ Green Needlegrass (HCPC)			Western Wheatgrass/Blue Grama/Buffalograss			Blue Grama/ Buffalograss Sod			Renovated Sod		
COMMON/GROUP NAME	SYMBOL	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			1350 - 1530	75 - 85		1120 - 1280	70 - 80		420 - 490	60 - 70		1120 - 1280	70 - 80
RHIZOMATOUS WHEATGRASS		1	540 - 900	30 - 50	1	320 - 640	20 - 40	1	35 - 105	5 - 15	1	320 - 640	20 - 40
western wheatgrass	PASM	1	540 - 900	30 - 50	1	320 - 640	20 - 40	1	35 - 105	5 - 15	1	320 - 640	20 - 40
thickspike wheatgrass	ELLAL	1	90 - 360	5 - 20	1	80 - 240	5 - 15	1	7 - 35	1 - 5	1	80 - 240	5 - 15
COOL-SEASON MID GRASS		2	450 - 720	25 - 40	2	160 - 320	10 - 20	2	0 - 35	0 - 5	2	160 - 320	10 - 20
green needlegrass	NAVI4	2	450 - 720	25 - 40	2	160 - 320	10 - 20	2	0 - 35	0 - 5	2	160 - 320	10 - 20
WARM-SEASON GRASSES		3	36 - 180	2 - 10	3	240 - 480	15 - 30	3	140 - 420	20 - 60	3	240 - 480	15 - 30
blue grama	BOGR2	3	36 - 180	2 - 10	3	160 - 320	10 - 20	3	105 - 350	15 - 50	3	160 - 320	10 - 20
buffalograss	BUDA	3	0 - 90	0 - 5	3	80 - 160	5 - 10	3	35 - 175	5 - 25	3	80 - 160	5 - 10
sideoats grama	BOCU	3	90 - 270	5 - 15	3	0 - 80	0 - 5	3	0 - 14	0 - 2	3	0 - 80	0 - 5
NATIVE GRASSES/GRASS-LIKES		4	90 - 270	5 - 15	4	80 - 400	5 - 25	4	70 - 210	10 - 30	4	80 - 400	5 - 25
big bluestem	ANGE	4	0 - 90	0 - 5	4	0 - 16	0 - 1				4	0 - 16	0 - 1
needleandthread	HECOC8	4	0 - 90	0 - 5	4	0 - 80	0 - 5	4	0 - 14	0 - 2	4	0 - 80	0 - 5
prairie junegrass	KOMA	4	0 - 90	0 - 5	4	0 - 80	0 - 5	4	0 - 70	0 - 10	4	0 - 80	0 - 5
Sandberg bluegrass	POSE	4	0 - 36	0 - 2	4	0 - 48	0 - 3	4	0 - 14	0 - 2	4	0 - 32	0 - 2
sedge	CAREX	4	0 - 90	0 - 5	4	80 - 320	5 - 20	4	35 - 105	5 - 15	4	80 - 320	5 - 20
threeawn	ARIST	4	0 - 36	0 - 2	4	0 - 32	0 - 2	4	7 - 105	1 - 15	4	0 - 32	0 - 2
dropseed	SPORO	4	0 - 18	0 - 1	4	0 - 80	0 - 5	4	7 - 70	1 - 10	4	0 - 80	0 - 5
other perennial grasses	ZGP	4	0 - 54	0 - 3	4	0 - 48	0 - 3	4	0 - 21	0 - 3	4	0 - 48	0 - 3
NON-NATIVE GRASSES		5			5			5	35 - 175	5 - 25	5	0 - 80	0 - 5
cheatgrass	BRTE							5	35 - 175	5 - 25	5	0 - 80	0 - 5
FORBS		6	90 - 270	5 - 15	6	80 - 240	5 - 15	6	70 - 140	10 - 20	6	80 - 240	5 - 15
American vetch	VIAM	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
aster	ASTER	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
biscuitroot	LOMAT	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
cudweed sagewort	ARLU	6	0 - 18	0 - 1	6	0 - 32	0 - 2	6	0 - 7	0 - 1	6	0 - 32	0 - 2
curlycup gumweed	GRSQ				6	0 - 16	0 - 1	6	0 - 35	0 - 5	6	0 - 16	0 - 1
cutleaf ironplant	MAPI	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
deathcamas	ZIGAD	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
deervetch	LOUNU	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
dotted gayfeather	LIPU	6	0 - 36	0 - 2	6	0 - 32	0 - 2	6	0 - 7	0 - 1	6	0 - 32	0 - 2
false boneset	BREU	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
goldenrod	SOLID	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
penstemon	PENST	6	0 - 36	0 - 2	6	0 - 32	0 - 2	6	0 - 7	0 - 1	6	0 - 32	0 - 2
prairie coneflower	RACO3	6	0 - 36	0 - 2	6	0 - 32	0 - 2	6	0 - 7	0 - 1	6	0 - 32	0 - 2
pussytoes	ANTEN	6	0 - 18	0 - 1	6	0 - 32	0 - 2	6	0 - 35	0 - 5	6	0 - 32	0 - 2
scarlet gaura	GACO5	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
scarlet globemallow	SPCO	6	0 - 36	0 - 2	6	0 - 32	0 - 2	6	0 - 35	0 - 5	6	0 - 32	0 - 2
scurfpea	PSORA2	6	0 - 36	0 - 2	6	0 - 48	0 - 3	6	0 - 70	0 - 10	6	0 - 48	0 - 3
thistle	CIRSI	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
western ragweed	AMPS	6	0 - 18	0 - 1	6	0 - 32	0 - 2	6	0 - 7	0 - 1	6	0 - 32	0 - 2
western wallflower	ERCAC	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
western yarrow	ACMI2	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
wild parsley	MUDI	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
woolly Indianwheat	PLPA2	6	0 - 18	0 - 1	6	0 - 16	0 - 1	6	0 - 7	0 - 1	6	0 - 16	0 - 1
other perennial forbs	ZFP	6	0 - 36	0 - 2	6	0 - 32	0 - 2	6	0 - 14	0 - 2	6	0 - 32	0 - 2
SHRUBS		7	90 - 180	5 - 10	7	80 - 240	5 - 15	7	70 - 140	10 - 20	7	80 - 240	5 - 15
black greasewood	SAVE4	7	0 - 18	0 - 1	7	0 - 32	0 - 2	7	0 - 14	0 - 2	7	0 - 32	0 - 2
broom snakeweed	GUSA2	7	0 - 18	0 - 1	7	0 - 48	0 - 3	7	14 - 56	2 - 8	7	0 - 48	0 - 3
cactus	OPUNT	7	0 - 18	0 - 1	7	0 - 48	0 - 3	7	14 - 56	2 - 8	7	0 - 48	0 - 3
fourwing saltbush	ATCA2	7	0 - 36	0 - 2	7	0 - 32	0 - 2				7	0 - 48	0 - 3
fringed sagewort	ARFR4	7	0 - 18	0 - 1	7	0 - 48	0 - 3	7	21 - 70	3 - 10	7	0 - 48	0 - 3
rose	ROSA5	7	0 - 36	0 - 2	7	0 - 48	0 - 3	7	0 - 14	0 - 2	7	0 - 48	0 - 3
winterfat	KRLA2	7	0 - 36	0 - 2	7	0 - 16	0 - 1						
other shrubs	ZSHRUB	7	0 - 36	0 - 2	7	0 - 32	0 - 2				7	0 - 32	0 - 2
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		
GRASSES & GRASS-LIKES			730 - 1485 - 2015		550 - 1280 - 1600		270 - 490 - 710		550 - 1280 - 1600				
FORBS			85 - 180 - 300		75 - 160 - 250		65 - 105 - 145		75 - 160 - 250				
SHRUBS			85 - 135 - 185		75 - 160 - 250		65 - 105 - 145		75 - 160 - 250				
TOTAL			900 - 1800 - 2500		700 - 1600 - 2100		400 - 700 - 1000		700 - 1600 - 2100				

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as "Desired Plant Communities". According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC's) will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Western Wheatgrass/Green Needlegrass Plant Community

This is the interpretive plant community for this site, and it is also considered the Historic Climax Plant Community (HCPC). This plant community evolved with grazing by large herbivores and is well suited for grazing by domestic livestock. This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of rest.

The potential vegetation is about 75% grasses or grass-like plants, 15% forbs, and 10% shrubs. Cool season grasses dominate this plant community. The major grasses include western wheatgrass and green needlegrass. Other grasses occurring on the site include blue grama, buffalograss, sideoats grama, prairie junegrass and sedge. Significant forbs include scarlet globemallow, biscuitroot, deer vetch, wild parsley, American vetch, and milkvetch. The significant shrubs that occur include cactus, winterfat, rose and fourwing saltbush.

This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). The diversity in plant species allows for high drought tolerance. Moderate or high available water capacity provides a favorable soil-water-plant relationship.

Overall the interpretive plant community has the appearance of being extremely stable, diverse and productive. Litter normally falls in place, and does not occur in excess amounts. Most plant species have a wide range of age classes represented and reproduction is not limited. Plant roots occupy most of the soil profile, which provides for soil stability and promotes infiltration.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year.

Growth curve number: NE6401

Growth curve name: Pine Ridge/Badlands, cool-season dominant.

Growth curve description: Cool-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	15	28	30	10	2	5	5	0	0

Transitions or community pathways leading to other plant communities are as follows:

- Continuous seasonal grazing during the active growing period of cool season plants will lead to the *Western Wheatgrass/Blue Grama/Buffalograss Plant Community*.

Western Wheatgrass/Blue Grama/Buffalograss Plant Community

This plant community develops under continuous seasonal grazing (i.e., grazing an area during the same season every year) or from over utilization during extended drought periods. The potential vegetation is made up of approximately 70% grasses and grass-like species, 15% forbs and 15% shrubs. The dominant grasses include blue grama, buffalograss, and western and/or thickspike wheatgrass. Other grasses may include green needlegrass, prairie junegrass, and Sandberg bluegrass. Significant forbs include scarlet globemallow, wild parsley, biscuitroot, deer vetch, asters, and milkvetch. The significant shrubs that occur include cactus, broom snakeweed and rose.

Compared to the Historic Climax Plant Community, the shortgrass species including blue grama and buffalograss have increased. The cool season species including western wheatgrass and green needlegrass have decreased in composition. Annual bromes, curlycup gumweed, sweetclover and other annual grasses and forbs can invade the site. While plant diversity is relatively high, the structure of the community is dominated by short grasses.

This plant community is resistant to change. The dominant herbaceous species are very adapted to grazing; however, the mid grass species and the more palatable forbs will decrease in the community through continuous seasonal grazing. If the herbaceous component is intact, it tends to be resilient if disturbance is not long-term. Because of the sod forming habit of the dominant shortgrass species, water infiltration is low, and runoff is moderate to high. Typically the runoff is very clean because of the low potential for on-site soil erosion. However, off-site areas may be affected by increased runoff.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year.

Growth curve number: NE6402

Growth curve name: Pine Ridge/Badlands, cool-season dominant, warm-season sub-dominant.

Growth curve description: Cool-season dominant, warm-season sub-dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	10	25	30	15	5	5	5	0	0

Transitions or community pathways leading to other plant communities are as follows:

- Prescribed grazing, which allows for adequate plant recovery periods, will move this plant community to the *Western Wheatgrass/Green Needlegrass Plant Community*. Periods of non-use or deferment may be a management option to reach the HCPC.
- With heavy continuous seasonal grazing or heavy continuous season long grazing this site will move towards the *Blue Grama/Buffalograss Sod Plant Community*.

Blue Grama/Buffalograss Sod Plant Community

This plant community develops under heavy continuous season-long grazing, and with continuous seasonal grazing with concentrated use in the early part of the growing season (as in calving/lambing pastures). It is made up of approximately 90% grasses (primarily short, warm season grasses), 8% forbs, and 2% shrubs. The dominant grasses include blue grama and buffalograss. Other grasses may include western wheatgrass, prairie junegrass, threeawn, and annual brome. The dominant forbs include slimflower scurfpea, pussytoes, curlycup gumweed and scarlet globemallow. The dominant shrub is cactus.

Compared to the Historic Climax Plant Community, short grasses have increased, and the cool season mid grasses have diminished greatly. Some forbs and cactus have either increased and/or invaded the site. Plant diversity is low.

This plant community is very stable. Generally, this plant community will require significant management inputs (i.e., high animal impact, long term prescribed grazing, favorable climatic conditions, etc.) and time to move it towards the Western Wheatgrass/Blue Grama/Buffalograss Plant Community. On-site soil erosion is low. Infiltration is low, and runoff is high. Typically the runoff is very clean because of the low potential for on-site soil erosion. However, off-site areas can be significantly impacted due to the increased runoff.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year.

Growth curve number: NE6404

Growth curve name: Pine Ridge/Badlands, warm-season dominant, cool-season sub-dominant.

Growth curve description: Warm-season dominant, cool-season sub-dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	8	15	24	23	15	5	5	0	0

Transitions or community pathways leading to other plant communities are as follows:

- Long-term prescribed grazing and favorable climatic conditions, which allows for adequate plant recovery periods, will move this plant community towards the *Western Wheatgrass/Blue Grama/Buffalograss Plant Community*. Periods of non-use or deferment may be a management option to facilitate this movement.
- Mechanical renovation (specifically contour furrowing) will move this plant community to the *Renovated Sod Plant Community*. Proper grazing management must be included in order to derive the benefits of renovation.

Renovated Sod Vegetation State

An altered vegetation community can be achieved through mechanical renovation. Renovation creates microrelief that alters the water cycle by increasing infiltration and decreasing runoff. The renovation reduces the sod-bound conditions, increasing the vegetative production potential. These factors favor cool season species such as western wheatgrass, green needlegrass, and a variety of forbs.

With proper management after renovation, this plant community will have similar plant composition and growth curve characteristics as the Western Wheatgrass/Blue Grama/Buffalograss Plant Community. However, the production could be higher, depending on the degree of alteration. Proper grazing management must be implemented to maintain this plant community.

If this plant community is subjected to excessive disturbance after renovation (i.e., heavy continuous seasonal or season-long grazing, excessive defoliation, etc.), the plant community will be similar to the Blue Grama/Buffalograss Sod Plant Community in most respects. The main difference is the microrelief created by the renovation.

Non-Disturbed, Go-back, Introduced, Invaded

This group includes four separate vegetation states that are highly variable in nature. They are derived through four distinct management scenarios, and are not related successional. Infiltration, runoff and soil erosion varies depending on the vegetation present on the site.

The **Non-Disturbed** state develops from extended periods of exclusion by large herbivores, fire suppression and lack of other surface disturbance. Plant litter accumulates in large amounts when this community first develops. Litter buildup reduces mature plant vigor and density, and seedling recruitment declines. Eventually litter levels become high enough that plant density decreases. Interspaces are commonly filled by annual forbs, annual grasses, and cryptogams. Typically rhizomatous grasses form small colonies because of a lack of tiller stimulation.

The **Go-back** state can be reached whenever severe mechanical disturbance (i.e., abandoned farmland) occurs. During the early successional stages, the species that mainly dominate are annual grasses and forbs, later being replaced by both native and introduced perennials. The vegetation on this site varies greatly, sometimes being dominated by three-awn, dropseed, annual brome, crested wheatgrass, buffalograss, broom snakeweed, sweetclover and non-native thistles. Other plants that commonly occur on the site include western wheatgrass, deathcamas, prickly lettuce, maretail, kochia, squirreltail, foxtail and annual sunflower.

The **Introduced** state is normally those areas seeded to crested wheatgrass, pubescent or intermediate wheatgrass and alfalfa. It may require considerable investment .

The **Invaded** state includes areas that have been invaded by species such as smooth brome, Kentucky bluegrass, non-native thistles, field bindweed, knapweeds, leafy spurge, hoary cress and other introduced species.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Western Wheatgrass/Green Needlegrass Plant Community (HCPC):

Western Wheatgrass/Blue Grama/Buffalograss Plant Community:

Blue Grama/Buffalograss Sod Plant Community:

Renovated Sod Plant Community:

Non-disturbed, Go-back, Introduced or Invaded Plant Community:

Animal Preferences (Quarterly – 1,2,3,4[†])

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-like							
big bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
blue grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
buffalograss	U U D U	N U D U	U U D U	N U D U	N U D U	U U D U	U U D U
dropseed	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N
green needlegrass	U P U D	N P N P	U P U D	N P N P	N P N P	U P U D	U P U D
needleandthread	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
Sandberg bluegrass	N U N N	N D N N	N U N N	N D N N	N D N N	N U N N	N U N N
sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
sideoats grama	U D P U	U P D U	U D P U	U P D U	U P D U	U D P U	U D P U
thickspike wheatgrass	U D D U	N D N N	U D D U	N D N N	N D N N	U D D U	U D D U
threeawn	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
western wheatgrass	U P D U	N D N N	U P D U	N D N N	N D N N	U P D U	U P D U
Forbs							
American vetch	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
aster	U U D U	U U D U	U U D U	U U D U	U U D U	U U D U	U U D U
biscuitroot	U D U U	U D D U	U D U U	U D D U	U D D U	U D U U	U D D U
cudweed sagewort	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U D U
cutleaf ironplant	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
deathcamas	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
deervetch	U U U U	U D D U	U U U U	U D D U	U D D U	U U U U	U D D U
dotted gayfeather	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
false boneset	U U D U	N D U N	U U D U	N D U N	N D U N	U U D U	N D U N
goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
penstemon	U U U U	U P P U	U U U U	U P P U	U P P U	U U U U	U P P U
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
pussytoes	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
scarlet gaura	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
scarlet globemallow	U U D U	U D D U	U U D U	U D D U	U D D U	U U D U	U D D U
scurfpea	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
thistle	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western ragweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western wallflower	U D U U	N U U N	U D U U	N U U N	N U U N	U D U U	N U U N
western yarrow	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
wild parsley	U D U U	U D D U	U D U U	U D D U	U D D U	U D U U	U D D U
woolly Indianwheat	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
Shrubs							
black greasewood	U D D U	T T T T	U D D U	D U U D	D U U D	U D D U	D U U U
broom snakeweed	N N N N	U U U U	N N N N	U U U U	U U U U	N N N N	U U U U
cactus	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
fourwing saltbush	P D D P	P D D P	P D D P	P D D P	P D D P	P D D P	P D D P
fringed sagewort	U U U U	U U U U	U U U U	U D D U	U P P D	U U U U	U U U D
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
winterfat	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

[†] Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions; however, *continuous grazing is not recommended*. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

Plant Community	Production (lbs./acre)	Carrying Capacity* (AUM/acre)
Western Wheatgrass/Green Needlegrass	1800	0.50 – 0.60
Western Wheatgrass/Blue Grama/Buffalograss	1600	0.45 – 0.55
Blue Grama/Buffalograss Sod	700	0.20 – 0.25
Renovated Sod	1600	0.50**

* Continuous season-long grazing by cattle under average growing conditions. If distribution problems occur, stocking rates must be reduced to maintain plant health and vigor.

** Highly variable; stocking rate needs to be determined on site.

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage. During the dormant period, the forage for livestock will likely be lacking protein to meet livestock requirements, and added protein will allow ruminants to better utilize the energy stored in grazed plant materials. A forage quality test (either directly or through fecal sampling) should be used to determine the level of supplementation needed.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group C. Infiltration varies from very low to moderate, and runoff potential varies from moderate to very high depending on soil hydrologic group, slope and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be high runoff when short grasses form a strong sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

No appreciable wood products are present on the site.

Other Products

Seed harvest of native plant species can provide additional income on this site.

Supporting Information

Associated Sites

(064XY027NE) – Clayey Overflow
(064XY015NE) – Silty 14-17" P.Z.

(064XY037NE) – Thin Upland
(064XY045NE) – Dense Clay

Similar Sites

- (064XY027NE) – Clayey Overflow
[more big bluestem; higher production]
(064XY015NE) – Silty 14-17" P.Z.
[less green needlegrass; more needleandthread]

Inventory Data References

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel was also used. Those involved in developing this site include: Stan Boltz, NRCS Range Management Specialist; Jill Epley, NRCS Range Management Specialist; Cheryl Nielsen, NRCS Range Management Specialist; L. Michael Stirling, NRCS Range Management Specialist.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417				
Ocular estimates				

State Correlation

This site has been correlated with Nebraska and Wyoming in MLRA 64.

Field Offices

Alliance, NE	Box Butte	Douglas, WY	Converse	Scottsbluff, NE	Scottsbluff
Bridgeport, NE	Morrill	Lusk, WY	Niobrara	Torrington, WY	Goshen
Chadron, NE	Dawes/Sioux	Rushville, NE	Sheridan	Wheatland, WY	Platte

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 25a – Pine Ridge Escarpment, and 43h – White River Badlands.

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (<http://hpccsun.unl.edu>)

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (<http://wcc.nrcs.usda.gov>)

USDA, NRCS. National Range and Pasture Handbook, September 1997

USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (<http://nasis.nrcs.usda.gov>)

USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, NRCS, Various Published Soil Surveys.

Site Description Approval

_____ State Range Management Specialist	_____ Date	_____ State Range Management Specialist	_____ Date
_____ State Range Management Specialist	_____ Date		